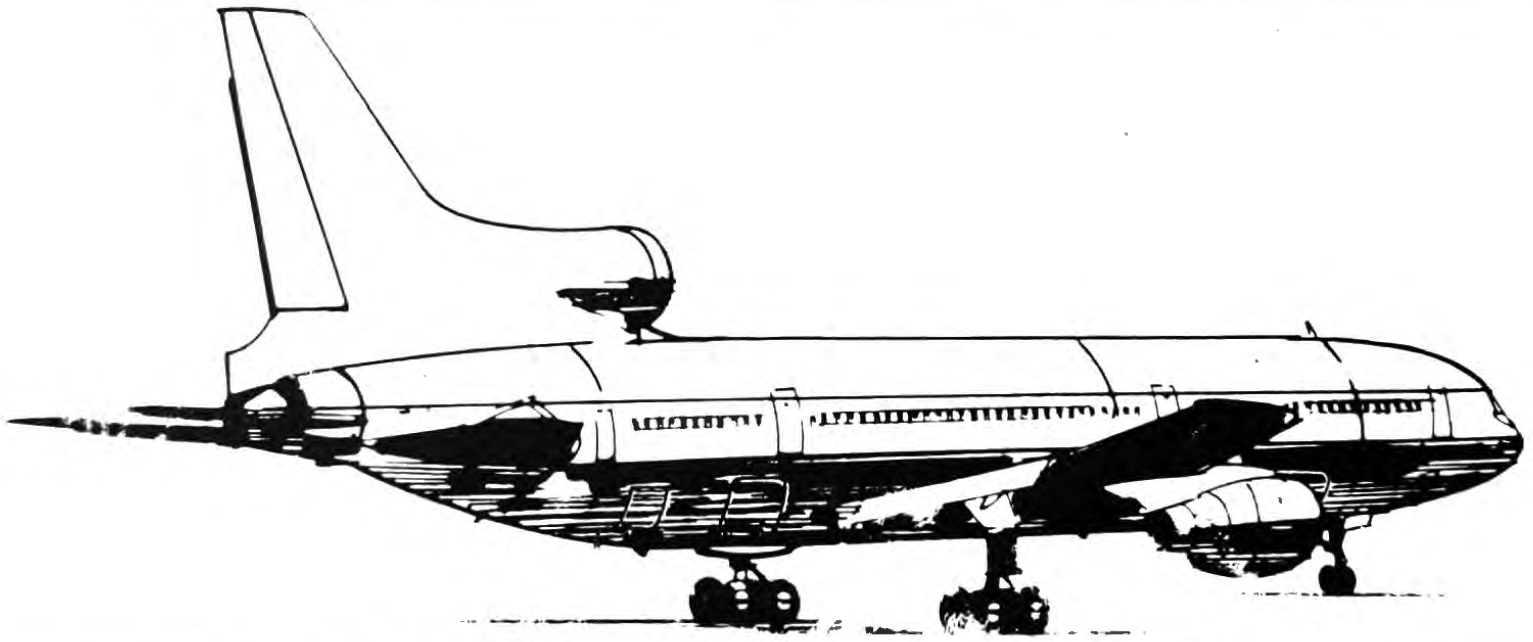
CARGO DOOR
RIGGING HANDBOOK
L-1, C-2 and C-3

TriStar L-1011

LOCKHEED-CALIFORNIA COMPANY



LOCKHEED L-1011 TriStar

LOCKHEED CALIFORNIA COMPANY
L-1011 C-1, C-2 AND C-3 CARGO DOOR RIGGING HANDBOOK

This Book is For Training Purposes Only.
Consult the L-1011 Maintenance Manual For the Latest
Information Data, Tolerances and Procedures

PREPARED BY

COMMERCIAL CUSTOMER TRAINING DEPARTMENT

P.S.C. 78-37899
DECEMBER 1978

STUDENT NOTES:

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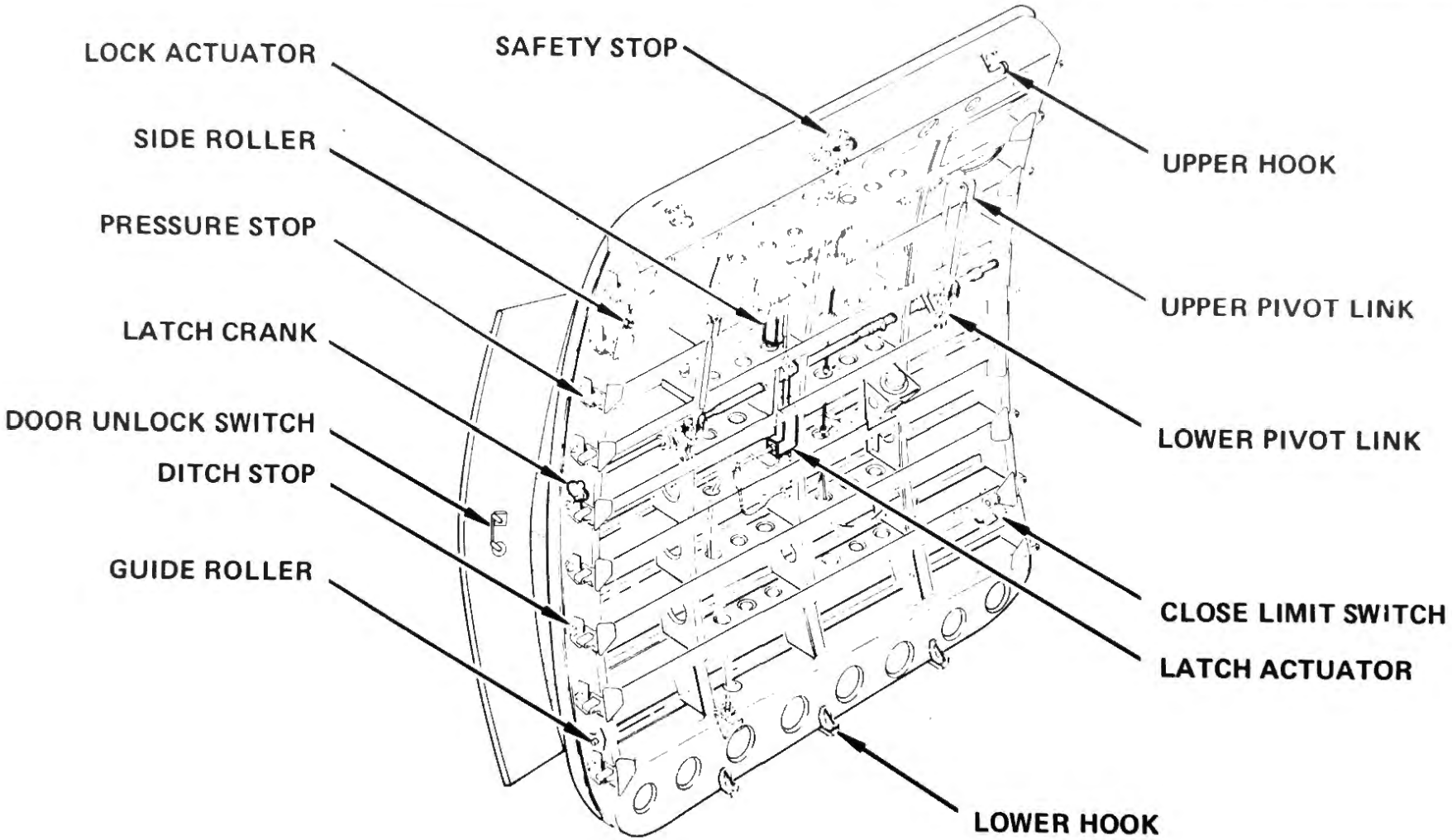


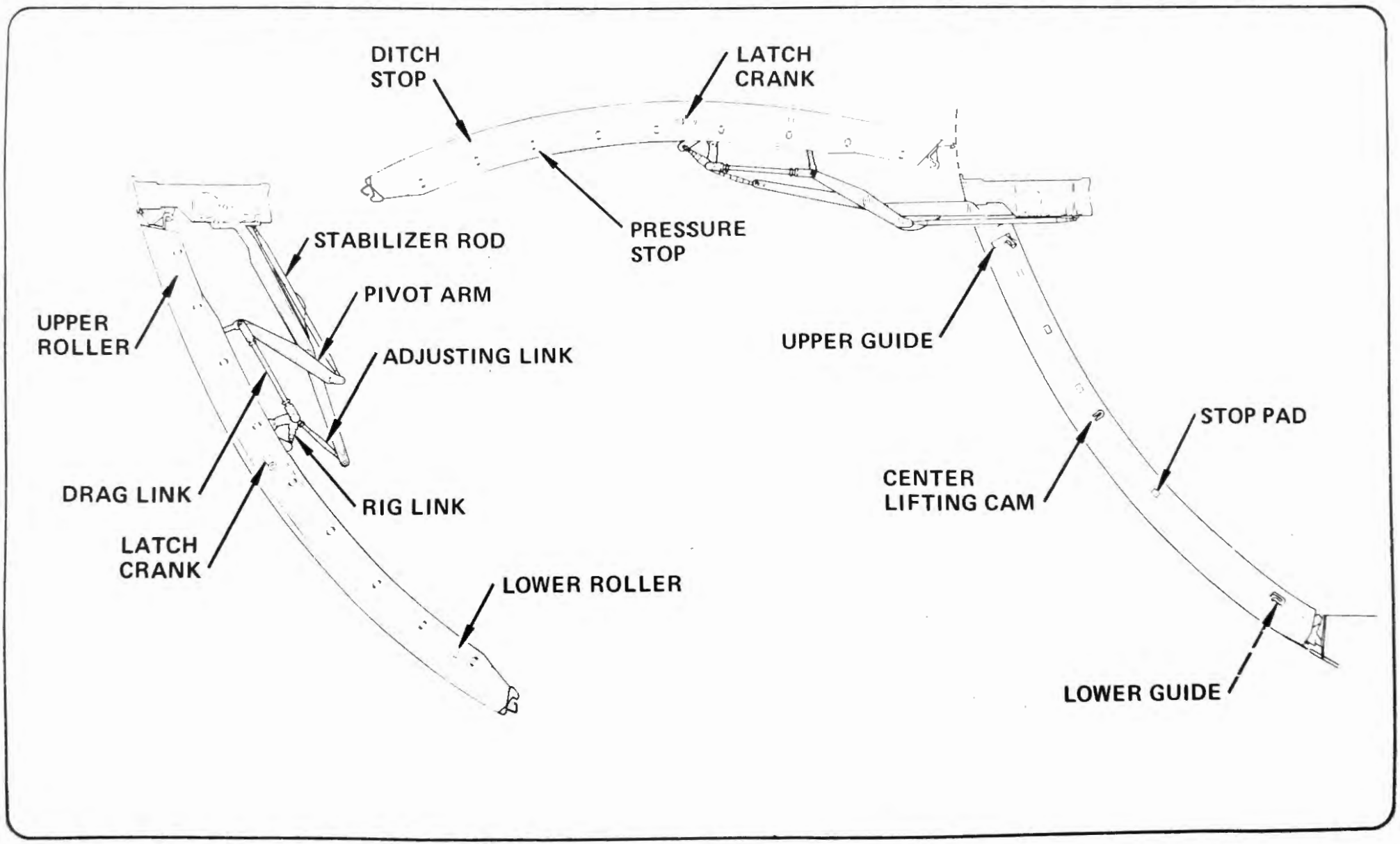
C-2 CARGO DOOR

INTRODUCTION

This handbook is intended as a quick, convenient educational supplement to the Maintenance Manual Rigging Procedures, and is in no way to be construed as an authority or authorizing document.

It is presumed that recourse to a door rigging adjustment is the result of a diagnosis that has eliminated other possible causes of a malfunction in the cargo door system, or is a result of a component part change.

6 GUIDE ROLLER ENTRY



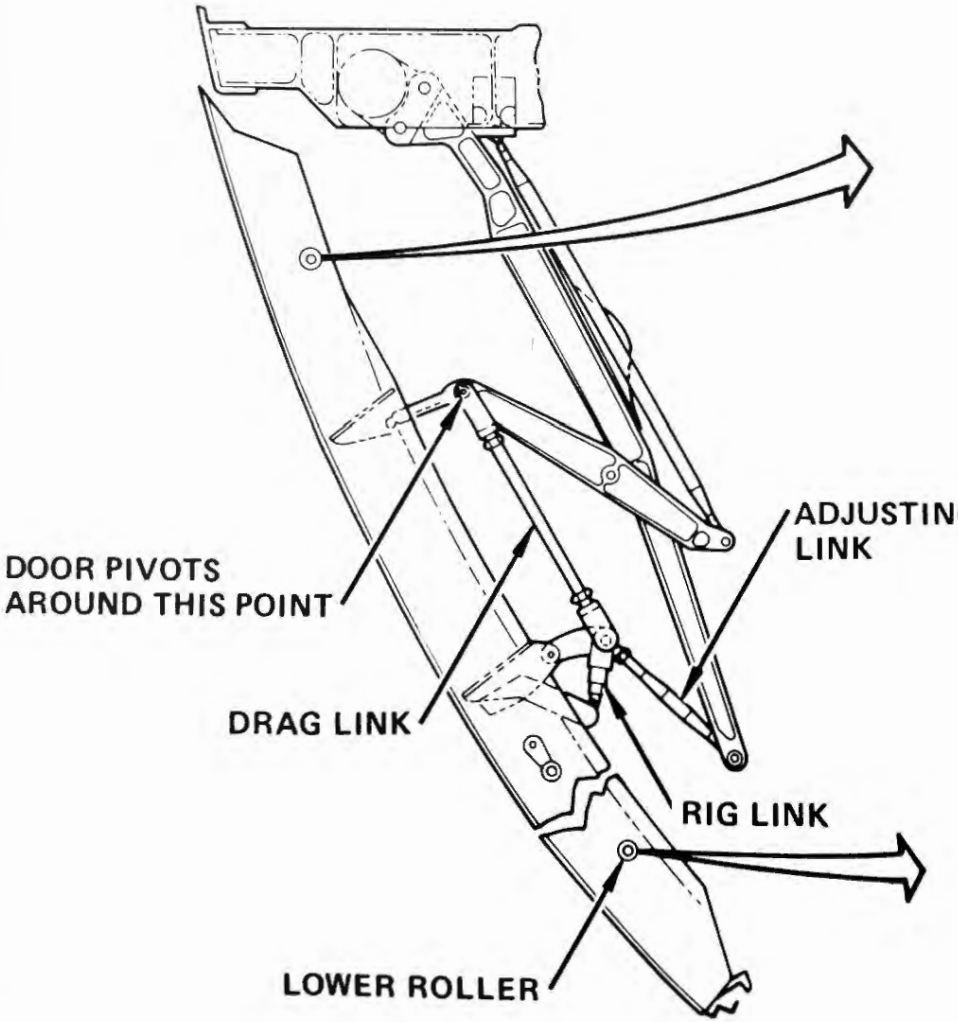
A guide roller is located at each upper and lower corner of the door, with corresponding roller guides at each side of the door surround structure. These rollers and guides ensure correct transition between the door closed and the door latched positions, and vice versa. Vertical movement of the door is achieved by rotation of the latch cranks, one each at the forward and aft edges of the door, which engage in center lifting cams on the door surround structure.

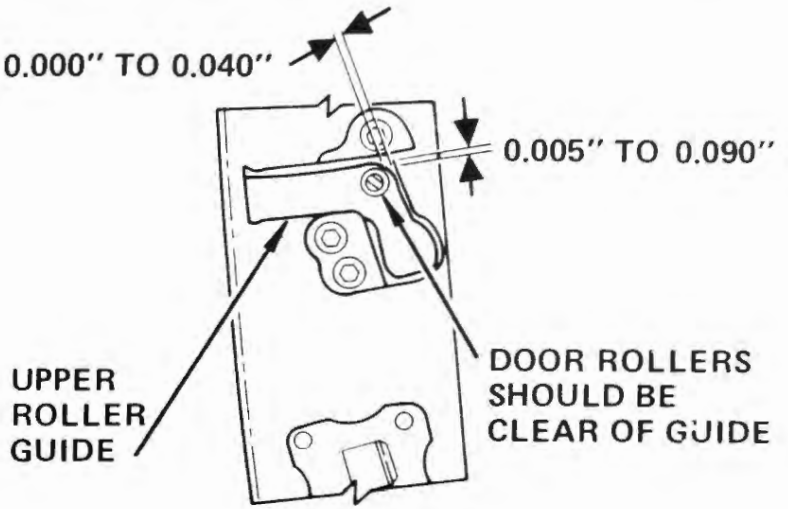
In the door closing mode of operation power is removed from the lift actuator and transferred to the latch actuator by operation of the door close limit switch located at the aft lower corner of the door. It is therefore necessary that the full inboard position of the door is dictated by the lower guide rollers.

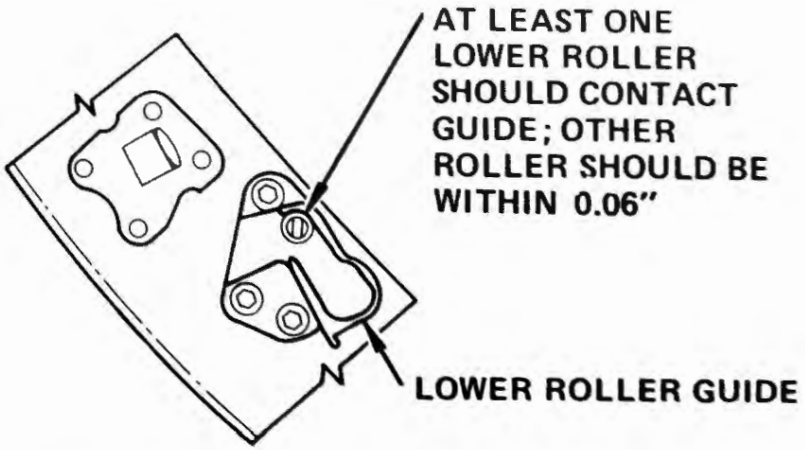
The guides and center lifting cams are located on bidirectional serrated plates for adjustment purposes. Under normal in service circumstances it should not be necessary to adjust their position. Failure of the door guide rollers to correctly align with the guides will most likely be caused by incorrect positioning of the door.

Door vertical position and attitude are controlled by the drag links, the adjusting links, and, to a lesser extent, the rig links.

8 GUIDE ROLLER ENTRY







ENTRY CHECK

Carefully move the door toward the closed position.

Ensure clean entry of the rollers into the guides.

Check that at least one lower roller contacts the face of the guide while the upper rollers are still clear.

Check clearances as follows:

- lower rollers — one touching, the other within 0.00 to 0.06";
- upper rollers — 0.00 to 0.04"
- clearance from upper flange, all rollers — 0.005"to 0.09".

ADJUSTMENT

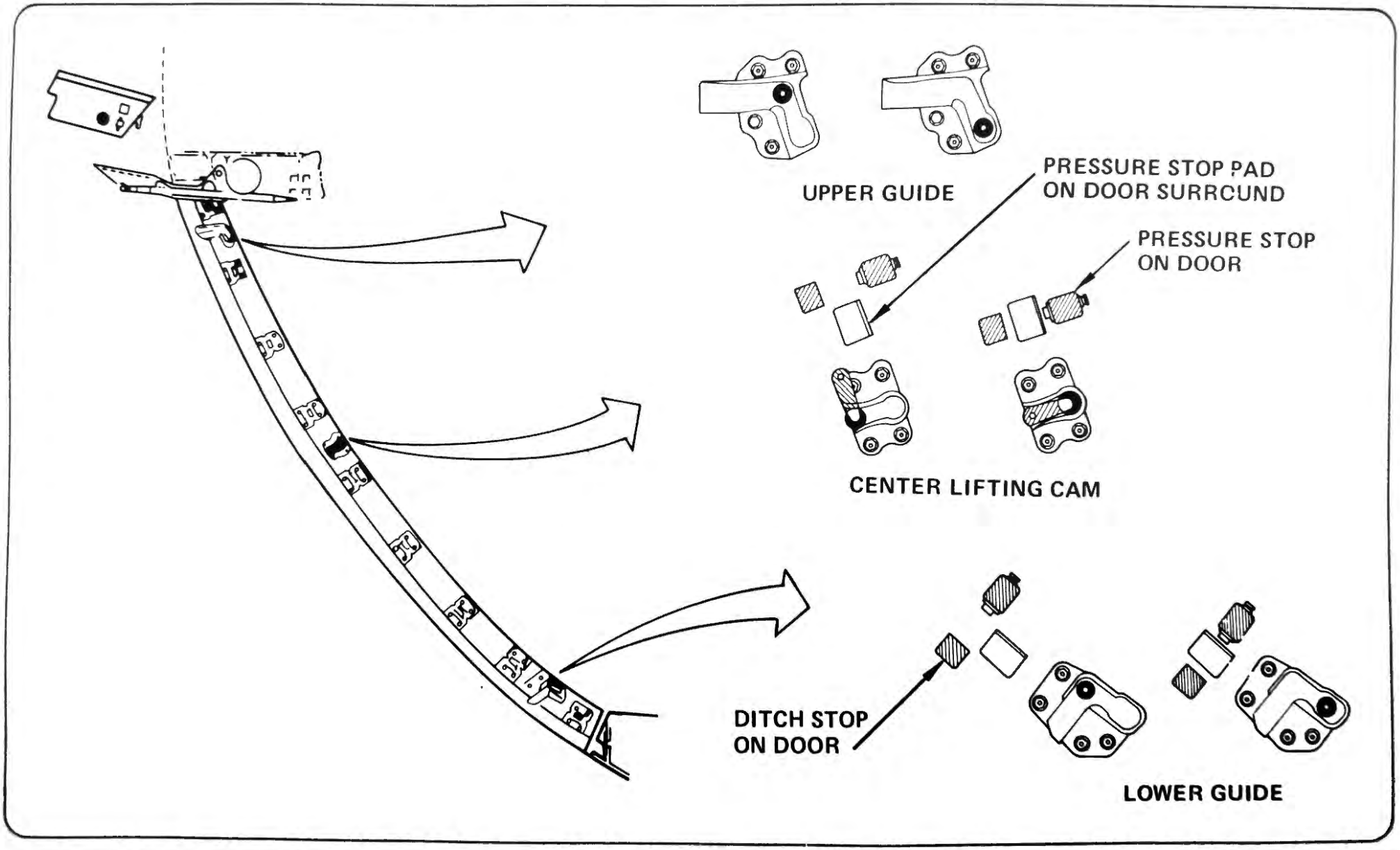
1. To move the door vertically, adjust the drag links as required to allow clean entry into the guides within the requisite vertical clearance tolerance. Shorten the links to raise the door, lengthen the links to lower the door. The rig links may be used instead of the drag links for fine vertical adjustment.

2. To move the door in or out for correct clearance or contact, adjust the adjusting links. Shorten the links to move the top of the door outward, lengthen the links to move the top of the door inward.

The adjusting links may also affect door vertical position therefore it is necessary to recheck the drag link adjustment.

> Ideally, both lower rollers should contact simultaneously. If this cannot be achieved, it is preferable that the aft roller contact its guide first. This will ensure repeatability of door close limit switch operation, which might not be achieved if the forward roller leads.

LATCHING


UPPER GUIDE
PRESSURE STOP PAD
ON DOOR SURRCUND
PRESSURE STOP
ON DOOR
CENTER LIFTING CAM
DITCH STOP
ON DOOR
LOWER GUIDE

Movement of the door from the closed position to the latched position is achieved by rotation of the latch cranks when they are in engagement with the center lifting cams. The latch cranks are on torque shafts which are rotated by the latch actuator. Range of movement is controlled by preset limit switches internal to the actuator.

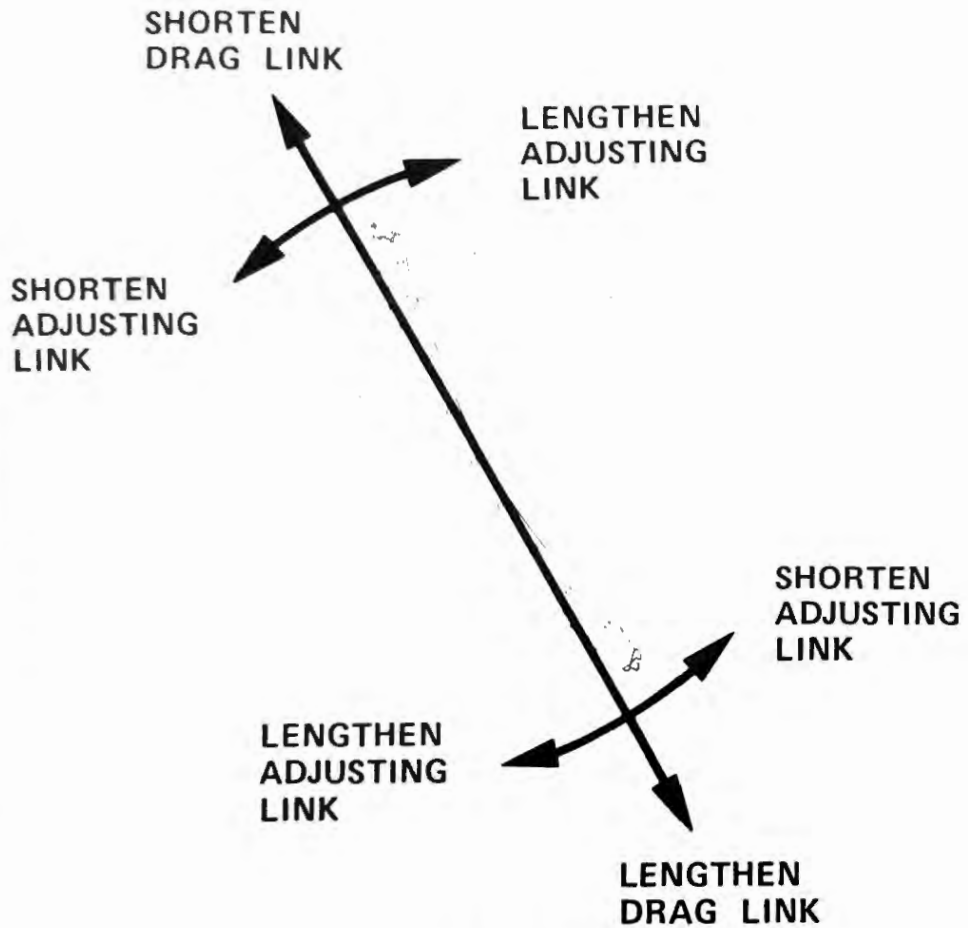
The latched position of the door is determined when the pressure stop bolts are vertically centered on the door surround pressure stop pads. Because the range of movement of the latch cranks is predetermined, the only variable factor for door latched position, in the vertical plane, is the center lifting cams.

Any cause for adjustment of center lifting cam position will require consequent adjustment of the upper and lower roller guides, and the drag links and perhaps the adjusting links on the door, to assure proper entry. The guides and center lifting cams are located on bidirectional serrated plates.

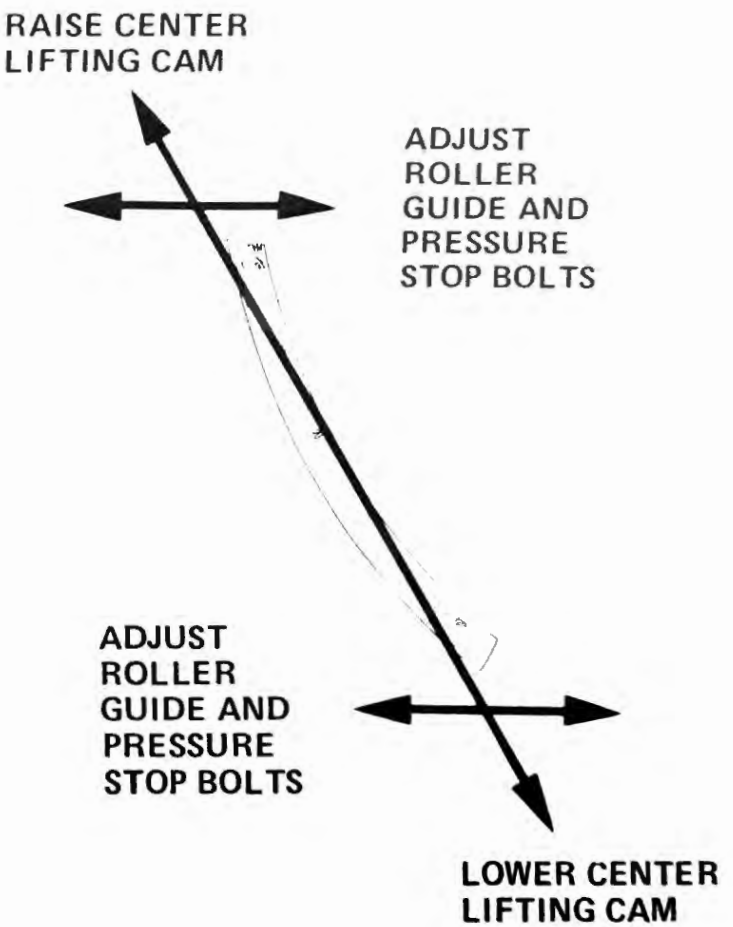
If interference occurs between pressure or ditch stops and the pressure stop pads, then transverse adjustment will have to be made. Transverse (inboard, outboard) position of the door is determined by the upper and lower roller guides in conjunction with the pressure stop bolts.

Under normal in service circumstances there is no reason to adjust the guides or the center lifting cams. Any failure of the door to correctly move to the latched position is the result of a fault elsewhere in the door system.

LATCHING



TO MOVE DOOR FOR
CORRECT ENTRY



TO ESTABLISH CORRECT LATCHED
POSITION OF DOOR

LATCHING CHECK

Move the door from the closed to the latched position.

Check for interference between the ditch stops on the door and the pressure stops on the surround structure.

Check for interference between the pressure stop bolts and the pressure stop pads on the surround structure.

Ensure that the pressure stop bolts are centered vertically on the pressure stop pads, within a tolerance of ±0.09''.

ADJUSTMENT

1. If interference occurs between the ditch stops and the pressure stop pads, then the door is too far in, as dictated by the roller guides.

- Back off pressure stop bolts as necessary.
- Adjust the roller guides outboard to establish the correct door to fuselage contour.
- Adjust the adjusting links for correct entry of the door rollers.
- Adjust the pressure stop bolts for correct clearance.

> Any time that the pressure stop bolts are adjusted, the upper and lower hooks must be checked for correct engagement, and adjusted as necessary.

2. If interference occurs between the pressure stop bolts and the stop pads, the problem lies with either the stop bolts or the roller guides.

- Back off the stop bolts, latch the door and check door to fuselage contour. If contour is within tolerance adjust the pressure stop bolts for correct clearance. If door contour is out of tolerance adjust the roller guides as required, adjust the adjusting links for correct roller entry, then adjust the pressure stop bolts for correct clearance.

STUDENT NOTES:

3. If it has been determined that the center lifting cam is incorrectly located, measure the movement required to center the pressure stop bolts on the stop pads.

- Open the door, mark the existing position of the center lifting cam, loosen the attaching bolts and move the cam the number of serrations required to establish the new latched position. Each serration represents 0.03" of vertical movement.

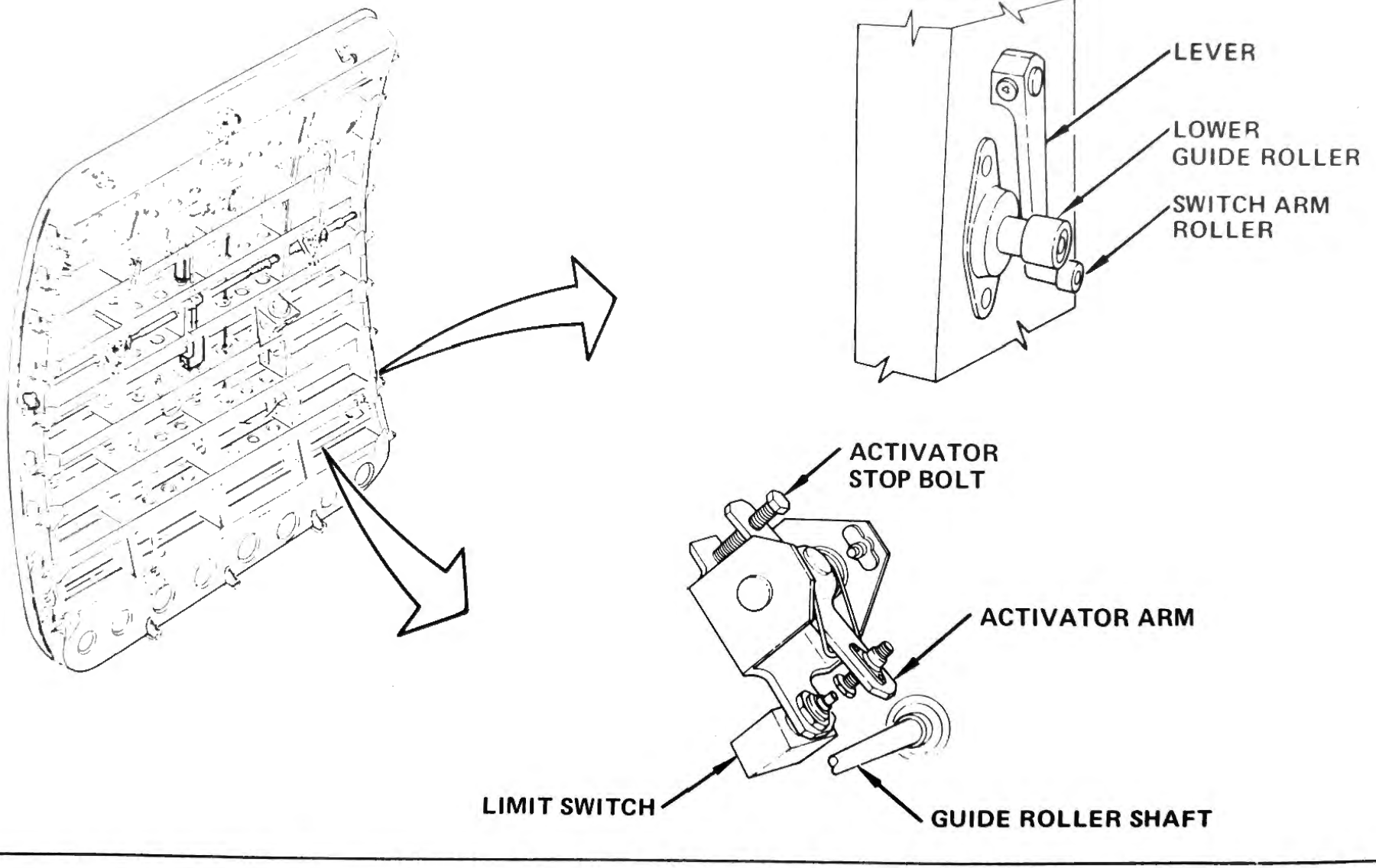
- Move the upper and lower roller guides a corresponding amount.

- Adjust the drag links and adjusting links for correct entry of the door rollers.

- Check latching operation and re-adjust as necessary.

If the center lifting cam is adjusted in the vertical plane, the safety stop mechanism must be checked for operation and correct clearance, and adjusted as necessary.

16 DOOR CLOSED LIMIT SWITCH

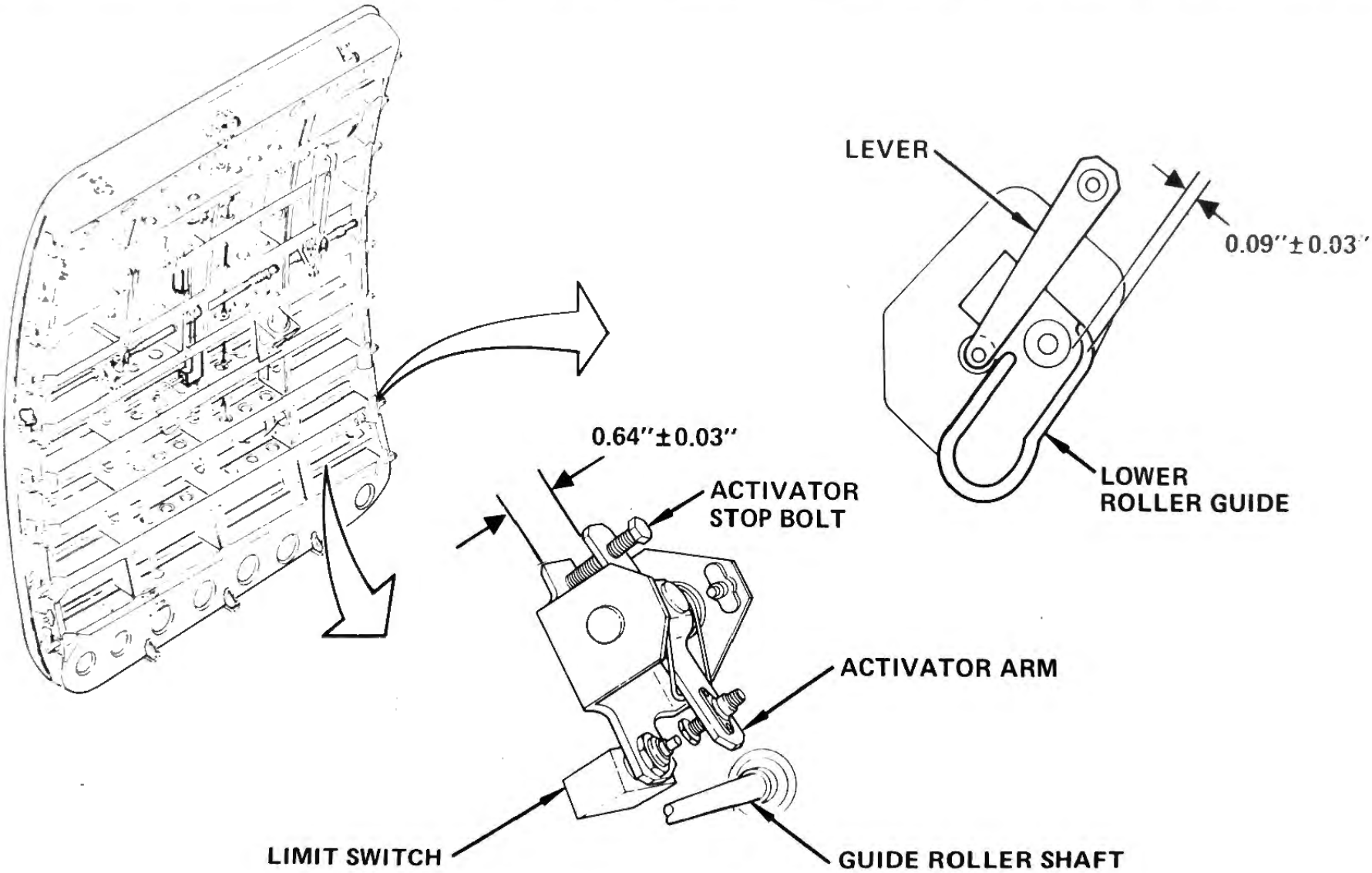


The door closed limit switch is located inside the door at the lower aft corner, and is accessible by removal of door trim. The switch is plunger operated through an activator arm which is on a shaft rotated by a lever. As the door approaches the closed position the lever contacts the outer face of the aft lower roller guide to operate the switch. This removes power from the lift actuator and sequences the latch actuator.

If the cargo compartment lights are not switched on manually, they will be automatically switched off by the door closed limit switch – a fact which can be used to advantage when making a fault diagnosis. Also, switch operation is audible, provided that peripheral noise is not excessive.

17 DOOR CLOSED LIMIT SWITCH

18 DOOR CLOSED LIMIT SWITCH



DOOR CLOSED LIMIT SWITCH CHECK

Electrically drive the door in the close direction.

Ensure that the door transitions from the closed to the latched position smoothly and without manual assistance.

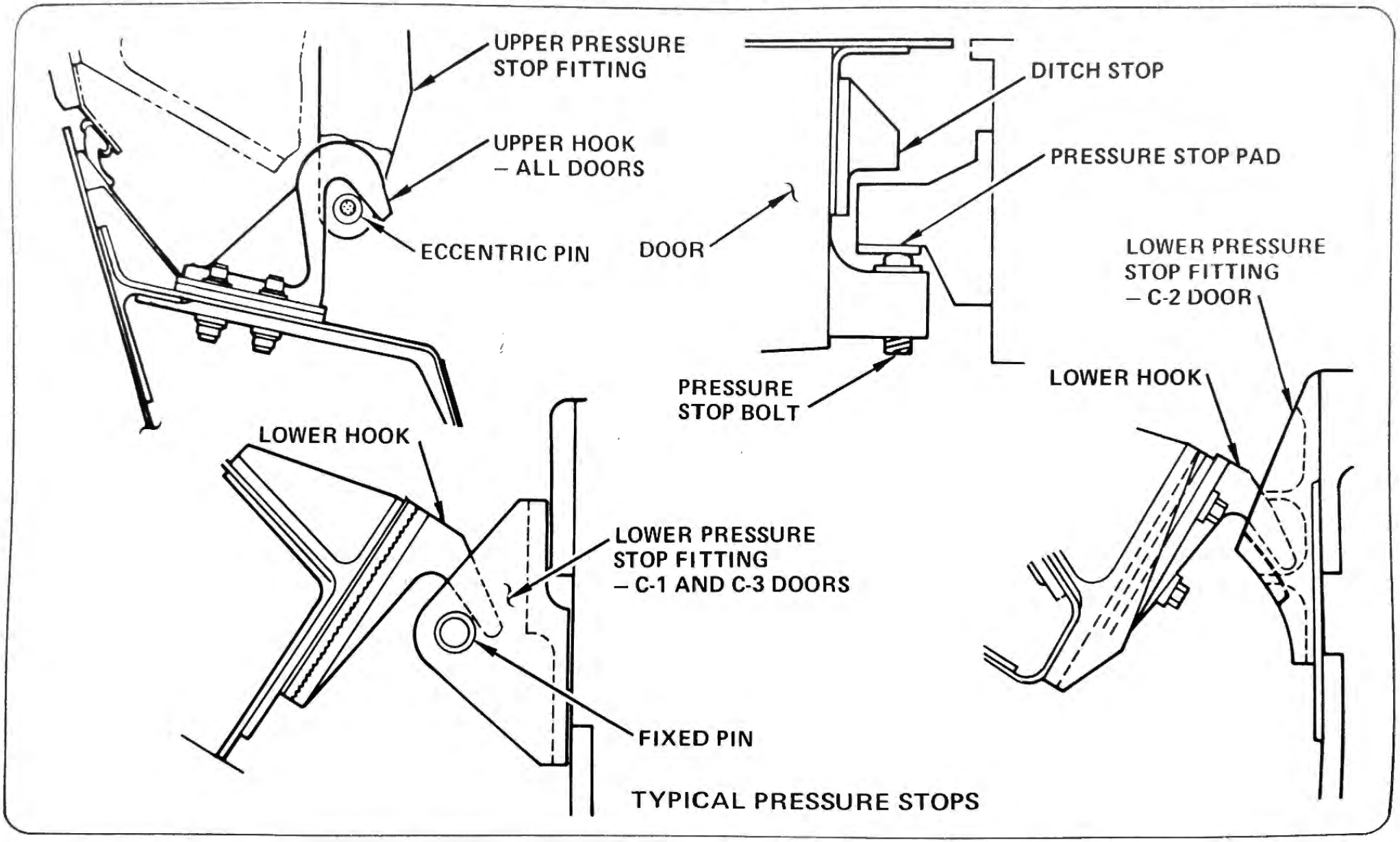
ADJUSTMENT

If the lift actuator stalls, or the door has to be assisted in the close direction by pushing on the lower aft corner, or if the latch actuator is sequenced to run but the door hangs up on the lower roller guide, then adjustment to the close limit switch is required.

- Check the dimension between the activator arm and its support bracket when in the unoperated position. This should be adjusted, on the stop bolt, to 0.64" ± 0.03".
- Manually move the door toward the closed position until the lower aft guide roller is 0.09" ± 0.03" from the inner face of the roller guide.
- Adjust the switch operating bolt until the switch is just actuated.
- Electrically operate the door to check for correct operation.

If the lower aft roller does not contact the guide at the door closed position — it is permitted to be 0.06" clear — then set the door close limit switch at the high end of its operating tolerance — 0.09" to 0.12" to ensure an actuating overlap.

20 PRESSURE STOPS AND HOOKS



TYPICAL PRESSURE STOPS

Pressurization loads are transferred from the cargo door to the fuselage by adjustable pressure stops at each of the door horizontal beams, and pressure stop pads on the door surround structure. Additionally, pressure loads are transferred at the top and bottom edges by upper and lower hooks. These stops and hooks also determine the door to fuselage contour when the aircraft is pressurized. When the aircraft is not pressurized the door contour is controlled by the upper and lower roller guides, and there is a clearance at the pressure stops and hooks.

To make pressure stop adjustment it will be necessary to simulate a pressurized condition by wedging the door outboard.

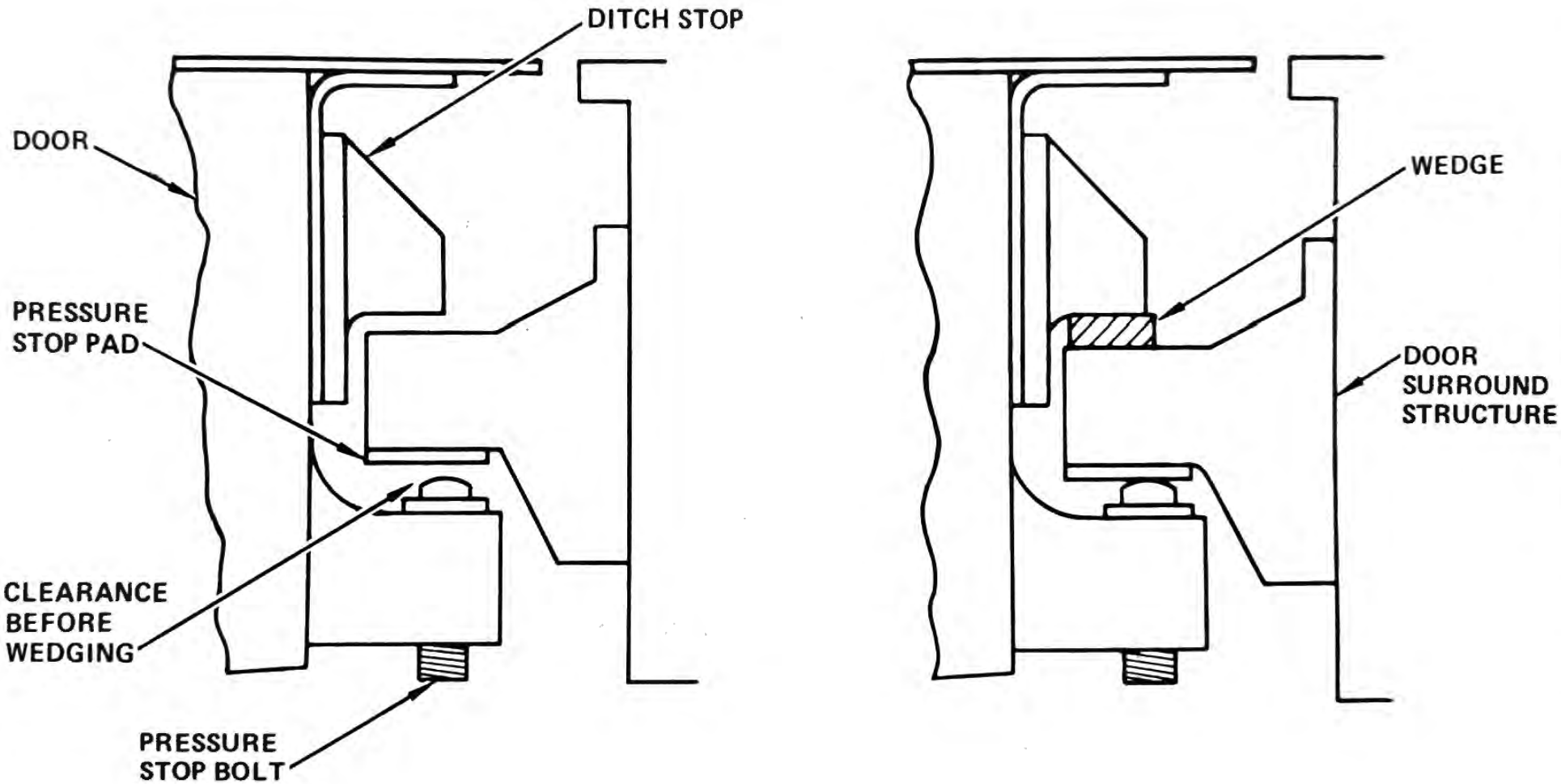
Pressure stops are adjustable by removing wire locks, and rotating the threaded bolt using a triwing screwdriver.

The hooks are positioned for fore and aft clearance, for depth of engagement (overlap), and vertical clearance from the hook pin or bracket.

All hooks may be positioned in two directions by shims and serrated plates, while upper hook pins are also eccentrically adjustable.

21 PRESSURE STOPS AND HOOKS

22 PRESSURE STOPS AND HOOKS



PRESSURE STOPS

PRESSURE STOP CHECK

Place the door in the closed and latched position.

Ensure that at least three guide rollers are contacting the outboard surface of their roller guides.

Check clearance at the four corner pressure stops is 0.015'' to 0.03''.

Insert wedges between the ditch stops and the pressure stop pads at the four corner positions to simulate pressurization loads. Check that upper and lower hooks are clear of their pins or brackets. Any obstruction must be cleared before proceeding. Pressure stop clearance must now be 0.00'' to 0.005''.

Check clearance at all other stop bolts is 0.00'' to 0.015''.

Measure clearance at each upper and lower hook in accordance with the table.

Measure overlap at each upper hook in accordance with the table.

Using the proper check tools, check C-1 and C-3 door lower hooks overlap is within the go/no go tolerance.

Measure the C-2 door lower hook overlap in accordance with the table.

ADJUSTMENT

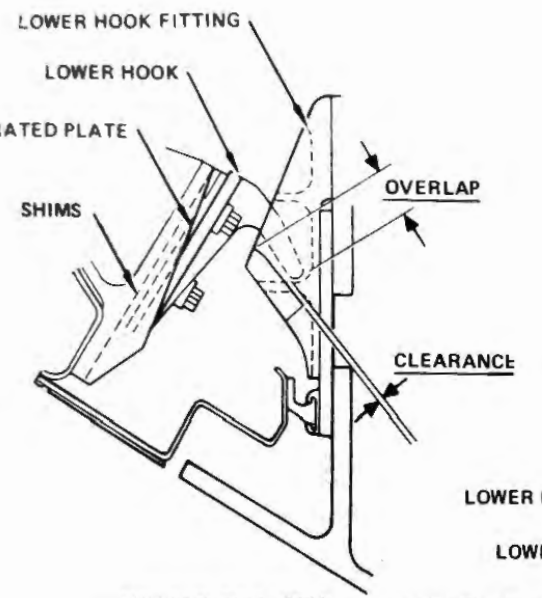
1. The upper and lower roller guides are used to determine the door position, and the four corner pressure stop pads are used as the prime locators for pressure stop to pressure stop pad adjustment.

- With door position dictated by the roller guides, adjust the four corner pressure stop bolts for a clearance of 0.015'' to 0.03''.
- Wedge the door outboard until the four corner pressure stop bolts clearances are 0.00 to 0.005''.
- Adjust all other stop bolts for a clearance of 0.00 to 0.015''.

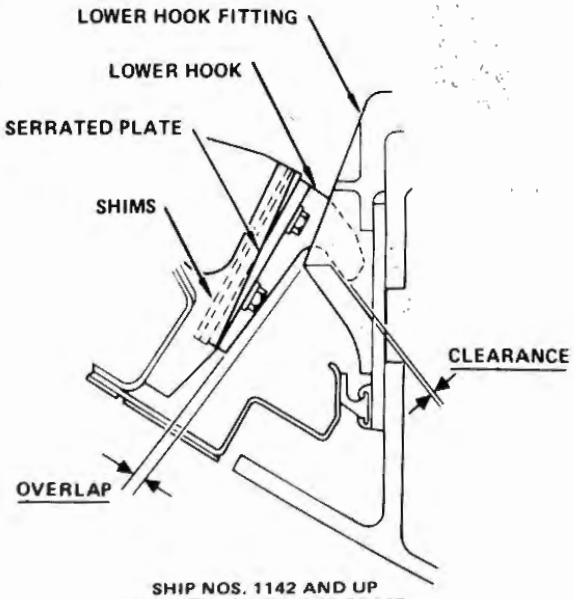
Pressure stop, and hook adjustments interact with each other. Adjustment of the pressure stops will require check and adjustment of the hooks.

24 PRESSURE STOPS AND HOOKS

C-2 LOWER HOOKS

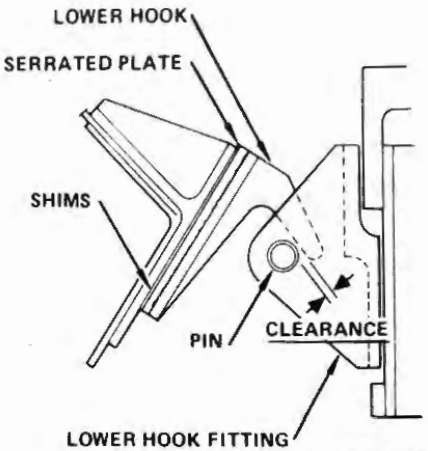


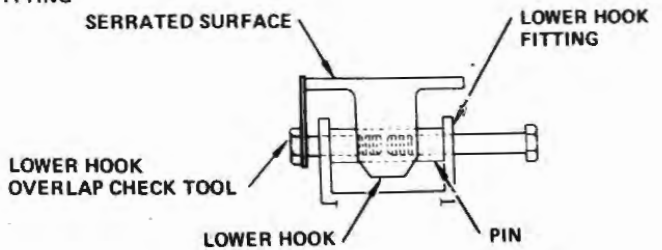
SHIP NOS. 1001 - 1141
WITHOUT SB 52-087

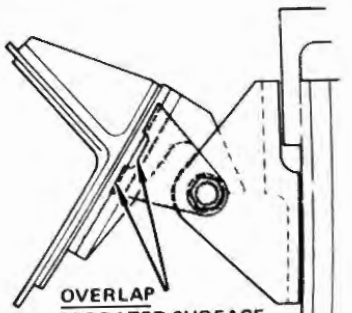


SHIP NOS. 1142 AND UP
AND OTHERS WITH SB 52-087

C-1 AND C-3 LOWER HOOKS







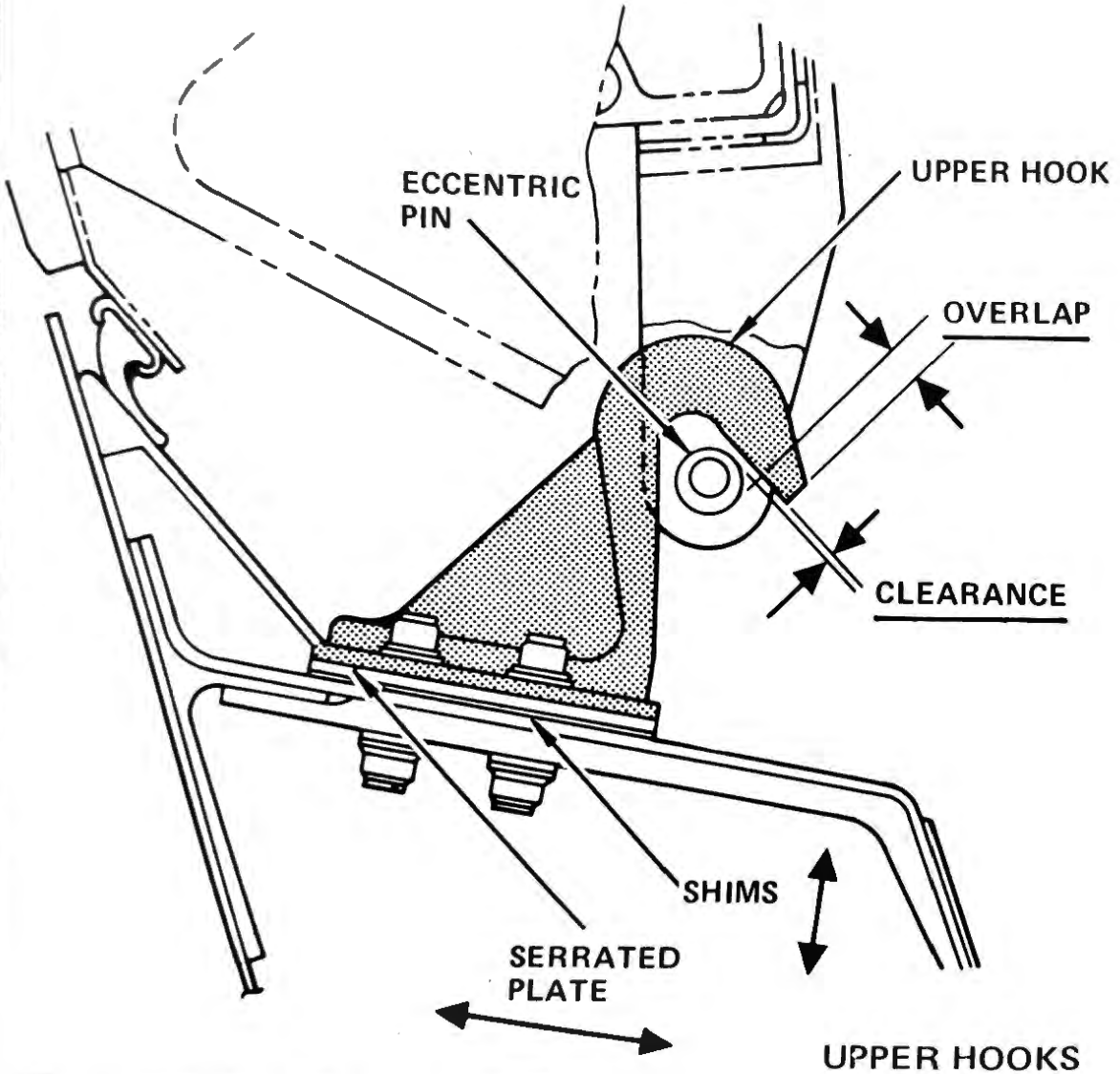
OVERLAP
SERRATED SURFACE OF HOOK MUST FALL BETWEEN THESE TWO SURFACES OF TOOL

2. To adjust C-1 and C-3 lower hooks for correct overlap, remove hook attachment bolts and add or remove shims until the serrated face of the hook falls between the go/no go faces of the respective hook check tool.

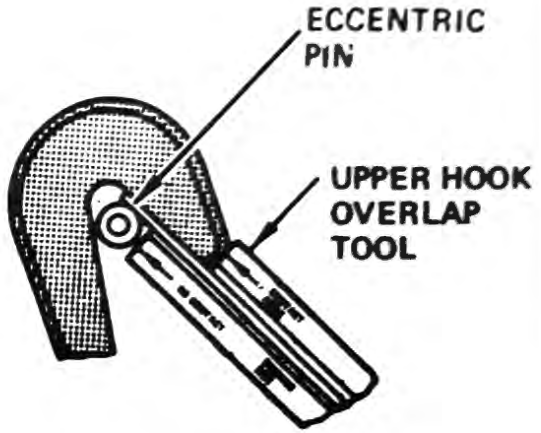
To adjust the C-2 lower hook overlap, remove the hook attachment bolts and add or remove shims to provide the correct overlap dimension shown in the table.

Lower hook clearance is adjusted by loosening the hook attachment bolts and moving the hook, as required, on its serrated plate.

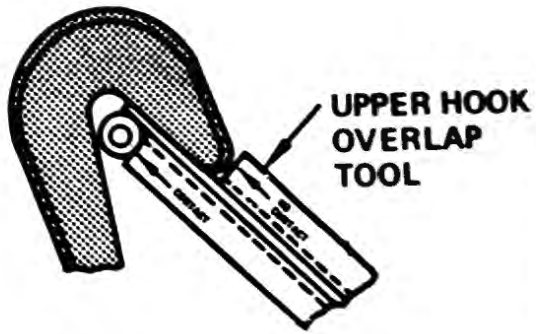
26 PRESSURE STOPS AND HOOKS



UPPER HOOKS



CHECK FOR MAXIMUM ACCEPTABLE HOOK OVERLAP



CHECK FOR MINIMUM ACCEPTABLE HOOK OVERLAP

3. Upper hook overlap and clearance are both affected by rotation of the eccentric upper hook pins.

• Unlock and rotate the pin for correct overlap, and, if possible, simultaneous correct clearance.

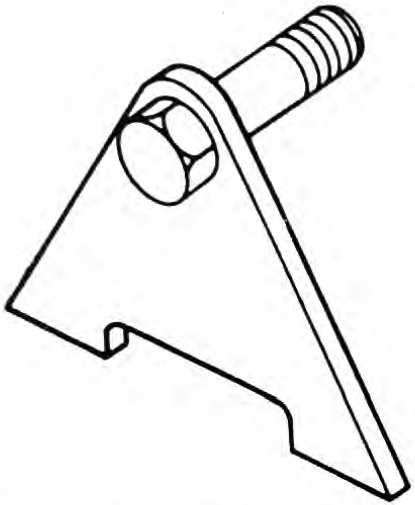
• If correct clearance cannot be established by eccentric pin adjustment, loosen hook attachment bolts and move the hook, as required, on its serrated plate.

Adjustments for hook overlap or clearance have an effect on each other which may require combination adjustments to achieve any one parameter.

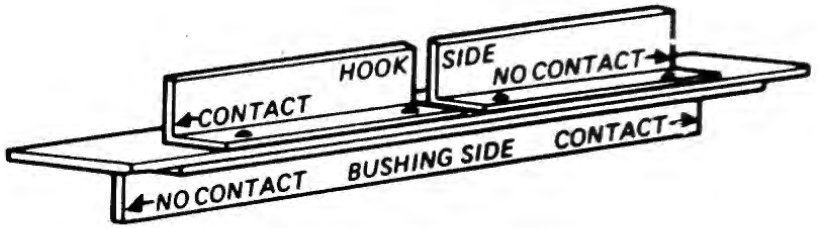
SPECIAL TOOLS

C-1 lower hook overlap tool	EL295 E5-101
C-3 lower hook overlap tool	EL295 E5-102
Upper hook overlap tool	1566156-901 SUT
Feeler gauge	EL705 F10-26

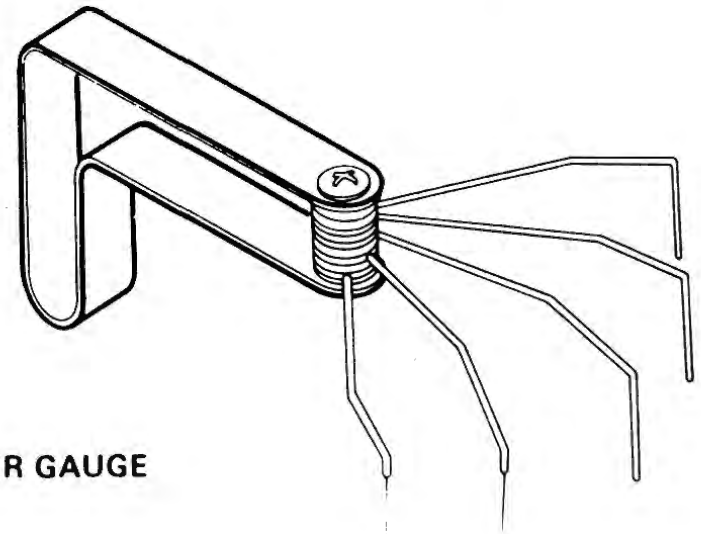
28 PRESSURE STOPS AND HOOKS



LOWER HOOK OVERLAP TOOL



UPPER HOOK OVERLAP TOOL

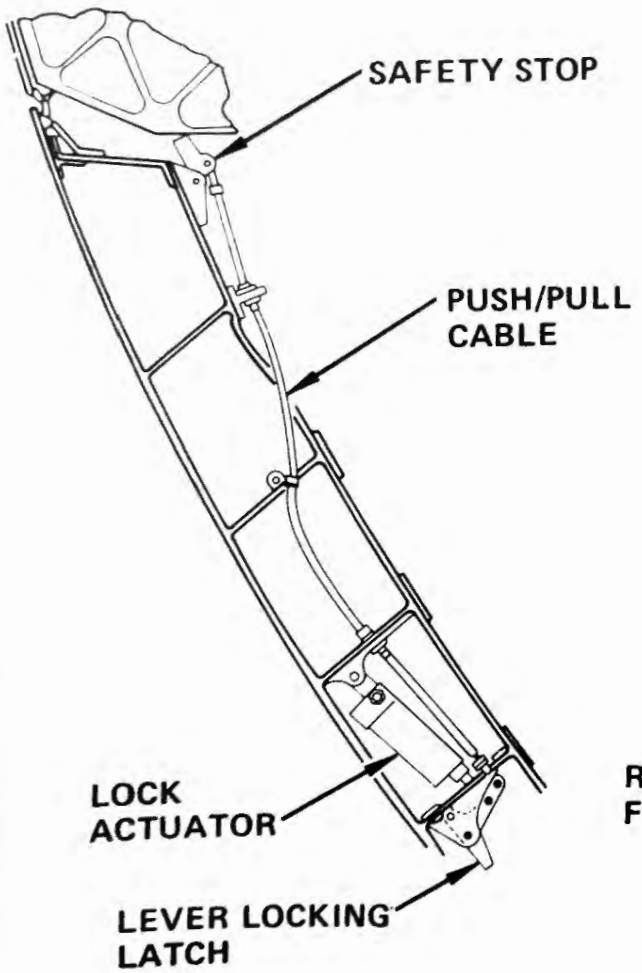


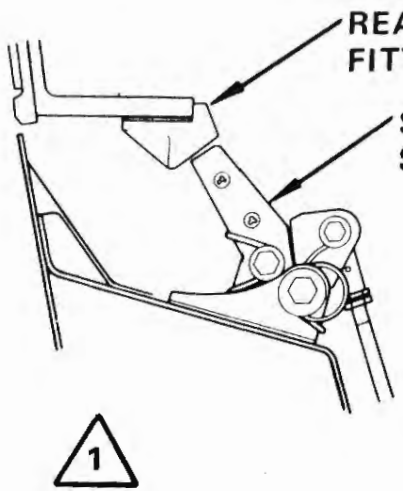
FEELER GAUGE

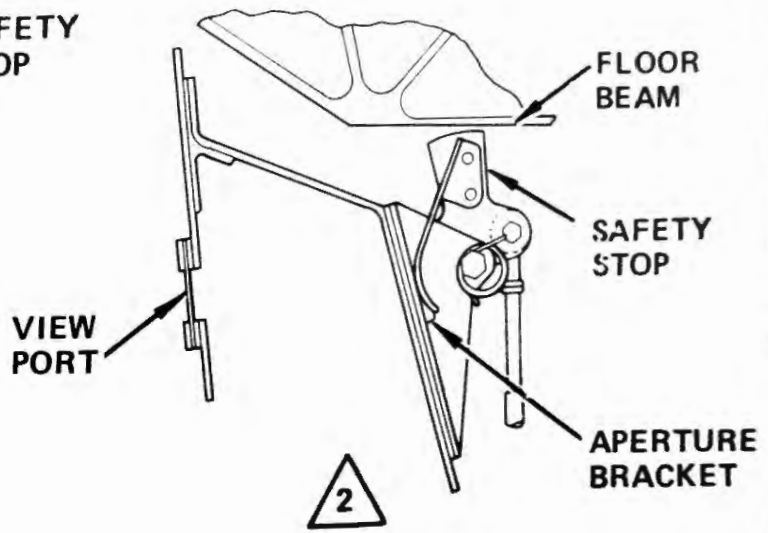
SPECIAL TOOLS

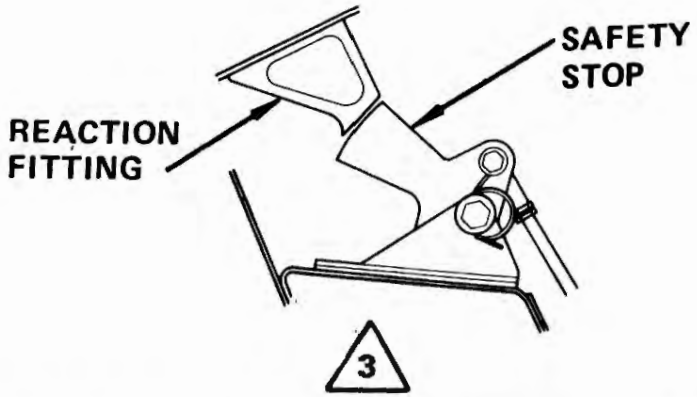
DOOR	HOOK		CLEARANCE	OVERLAP	NOTES
C-1	UPPER	FWD	0.02 - 0.08	0.29 - 0.39	ONE SERRATION ON ANY HOOK GIVES 0.03 " ADJUSTMENT
		MID	0.04 - 0.1	0.29 - 0.39	
		AFT	0.02 - 0.08	0.29 - 0.39	
	LOWER	FWD	0.01 - 0.072	CHECK TOOL EL 295E5-101	
		MID	0.032 - 0.095		
		AFT	0.01 - 0.072		
C-2	UPPER	FWD	0.02 - 0.08	0.29 - 0.39	AIRCRAFT WITH SB52-087 OR POST PROD SHIP NO. 1142 C-2 LOWER HOOK OVERLAP IS ESTABLISHED BY A CLEARANCE DIMENSION, AS SHOWN, OF 0.06" TO 0.15"
		MID	0.04 - 0.1	0.29 - 0.39	
		AFT	0.02 - 0.08	0.29 - 0.39	
	LOWER	FWD	0.01 - 0.072	0.79 MIN	
		MID	0.032 - 0.095	0.71 MIN	
		AFT	0.01 - 0.072	0.79 MIN	
C-3	UPPER	FWD	0.02 - 0.08	0.29 - 0.39	
		AFT	0.02 - 0.08	0.29 - 0.39	
	LOWER	FWD	0.01 - 0.072	CHECK TOOL EL 295E5-102	
		AFT	0.01 - 0.072		

30 SAFETY STOP MECHANISM









1 C-1 WITH THIN FINGER

2 C-2 WITH DIRECT VIEW

3 C-3 WITH FAT FINGER

When the cargo door is properly closed, latched, and locked, vertical movement from the plug position is prevented by the safety stop. A secondary function of the lock mechanism is to prevent inadvertent rotation of the latch torque tube.

The safety stop is extended to the lock, or retracted to the unlock position by the lock actuator, through a flexible push/pull cable. When extended, the safety stop aligns below a reaction fitting attached to the cabin floor support structure at the C-1 and C-3 doors, and below a cabin floor support beam at the C-2 location.

There are several differences in stop configuration, the main variants being

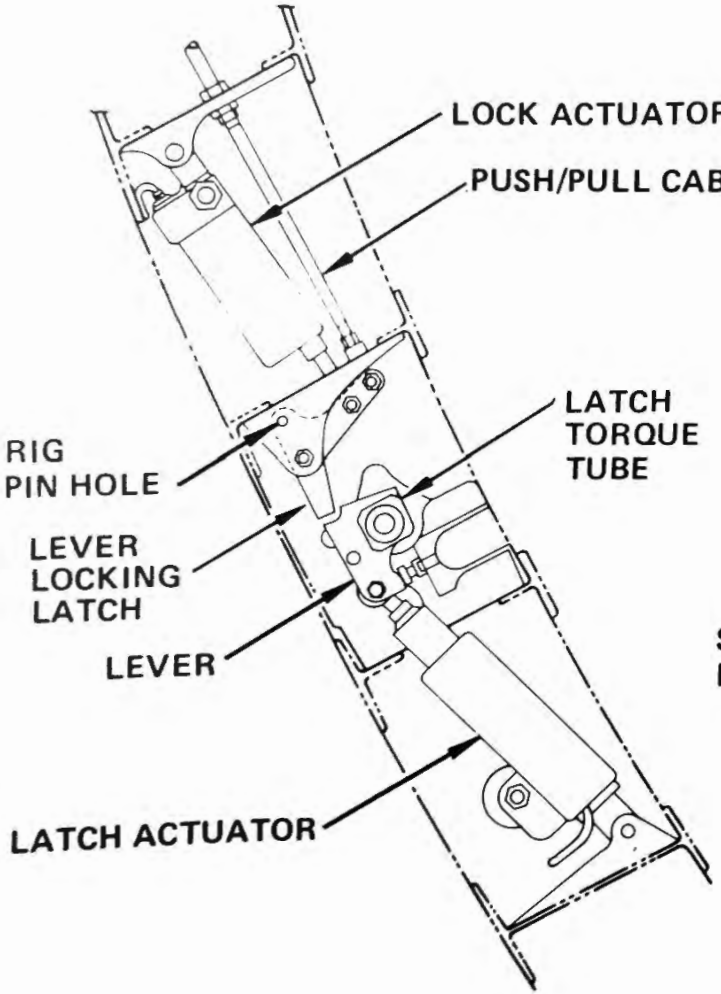
- a two piece stop – the "thin finger"
- a one piece, broader stop – the "fat finger"
- the fat finger incorporating a direct view indicator.

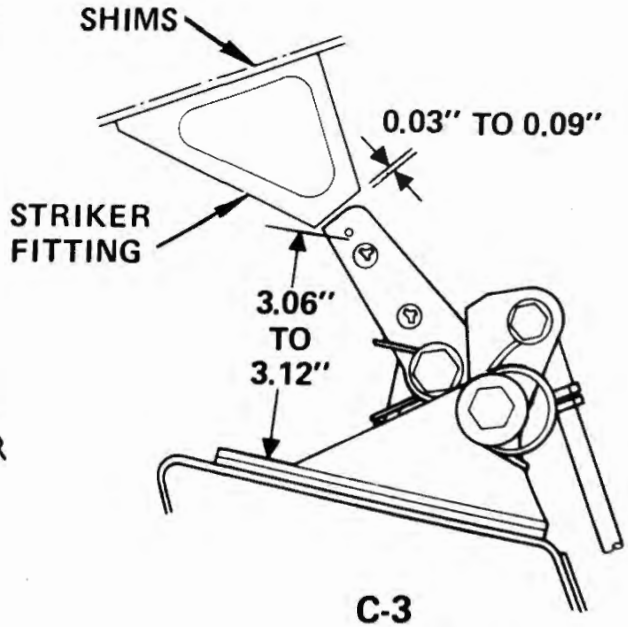
The lock actuator range of movement is predetermined by internal limit switches and mechanical stops. The correct position for actuator installation, to relate it to the lock mechanism, is with the actuator retracted to the lock position, a rig pin inserted in the lever locking latch, and the actuator rod end adjusted to fit.

The extended position of the safety stop is established by measurement. Vertical clearance between the safety stop and the reaction fitting, or floor beam, is a critical dimension.

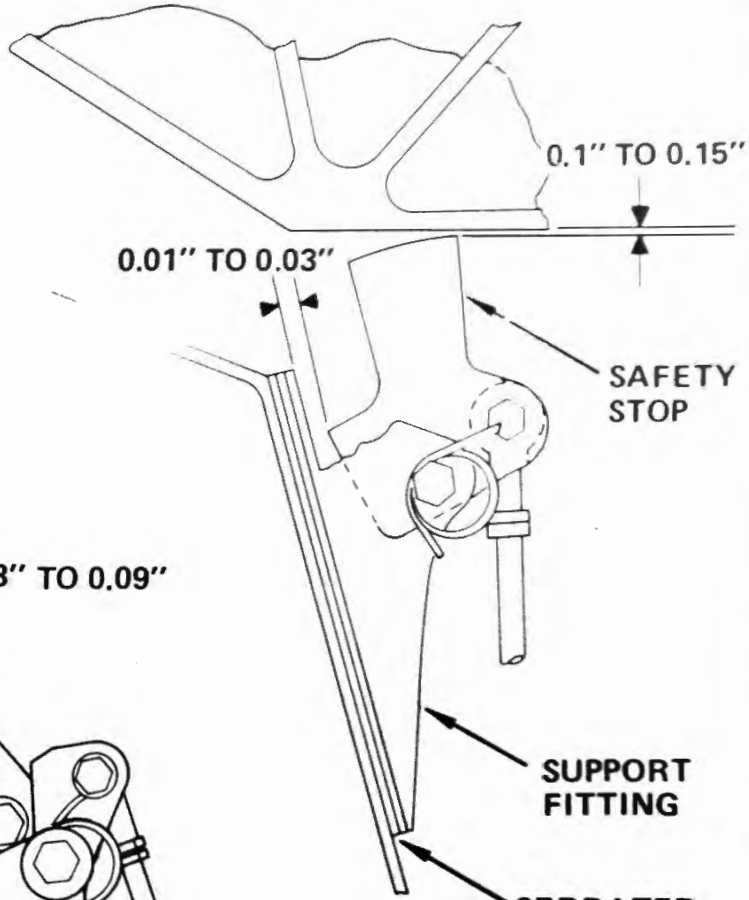
31 SAFETY STOP MECHANISM

32 SAFETY STOP MECHANISM





C-3



C-2

TYPICAL SAFETY STOP DIMENSIONS

SAFETY STOP CHECK

Operate the door to the locked position.

If the lock actuator dash number is -119, or later, rotate the manual drive knob, approximately a 1/2 turn, until the internal mechanical lock limit is reached.

Insert a rig pin through the lever locking latch and its support bracket.

* On C-1 and C-2 doors, and C-3 doors with the fat finger, check that clearance between safety stop and its support bracket is 0.01" to 0.003".

* On C-3 doors with the thin finger, check dimension between the lower edge of the 1/8" diameter hole in the safety stop, and the horizontal face of its support bracket, is 3.06" to 3.12".

** Check indicator is located within the rectangular slot in the aperture bracket.

*Aircraft without direct view system
**Aircraft with the direct view system

Check that clearance between upper face of safety stop and the face of the reaction fitting, or floor beam, is 0.03" to 0.09".

> Service Bulletin 52-118 authorizes an increase in vertical clearance to 0.1" to 0.15". This is intended to reduce the sensitivity of the lock mechanism to small variations in door vertical position. SB52-118 is incorporated in production in Lockheed ship serial number 1157 and up.

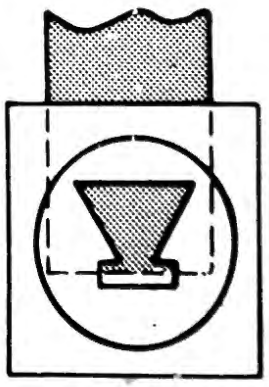
ADJUSTMENT

1. For lock mechanism rigging purposes lock actuators -117 and older are electrically driven to their lock position, while -119 and later actuators must be manually driven to their mechanical lock limit.

• Insert the rig pin in the lever locking latch. If it will not enter freely, adjust the actuator rod end.

> The rigged position of the lever locking latch also sets the latched position of the latch actuator and torque tube.

34 SAFETY STOP MECHANISM

DOOR	SAFETY STOP		
	THIN FINGER	FAT FINGER	DIRECT VIEW
C-1 AND C-2	SAFETY STOP TO SUPPORT BRACKET 0.01" TO 0.03"	SAFETY STOP TO STOP BOLT ON SUPPORT BRACKET 0.01" TO 0.03"	THE WHITE INDICATOR SHOULD BE VISIBLE IN THE RECTANGULAR CUTOUT OF THE APERTURE BRACKET
C-3	SAFETY STOP 1/8" HOLE TO SUPPORT BRACKET 3.06" TO 3.12"		

2. If the extended safety stop does not comply with the dimensions or positions shown in the table, then push/pull cable adjustment is necessary.

• Disconnect the push/pull cable from the lever locking latch and adjust as necessary. If sufficient adjustment is not available at the lower end, loosen the jamnut at the upper end and rotate the cable core. Check cable ends for safety and reconnect the lower end.

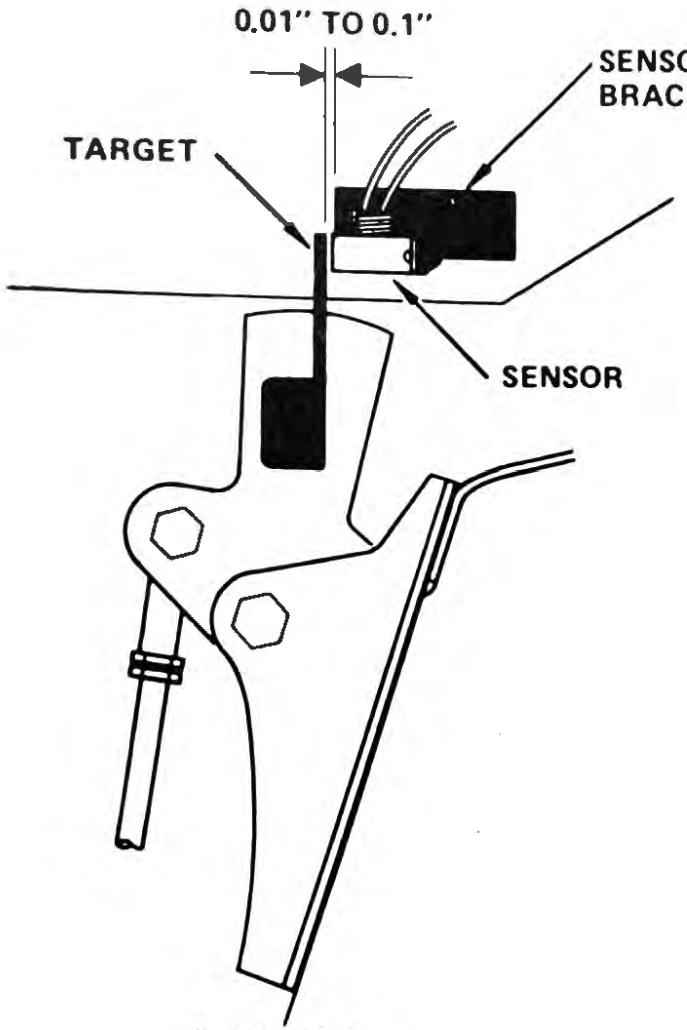
Any adjustment which changes the lock position of the safety stop will require check and adjustment of the proximity sensor gap.

3. If the safety stop vertical clearance is out of tolerance, it may be adjusted on C-1 and C-3 doors by removing the reaction fitting attachment bolts and adding or removing shims as required. On C-2 door, adjustment is made by loosening the safety stop support bracket attachment bolts, and raising or lowering the bracket on its serrated plate. This latter adjustment, at C-2 door, will require recheck and adjustment of the extended position of the safety stop.

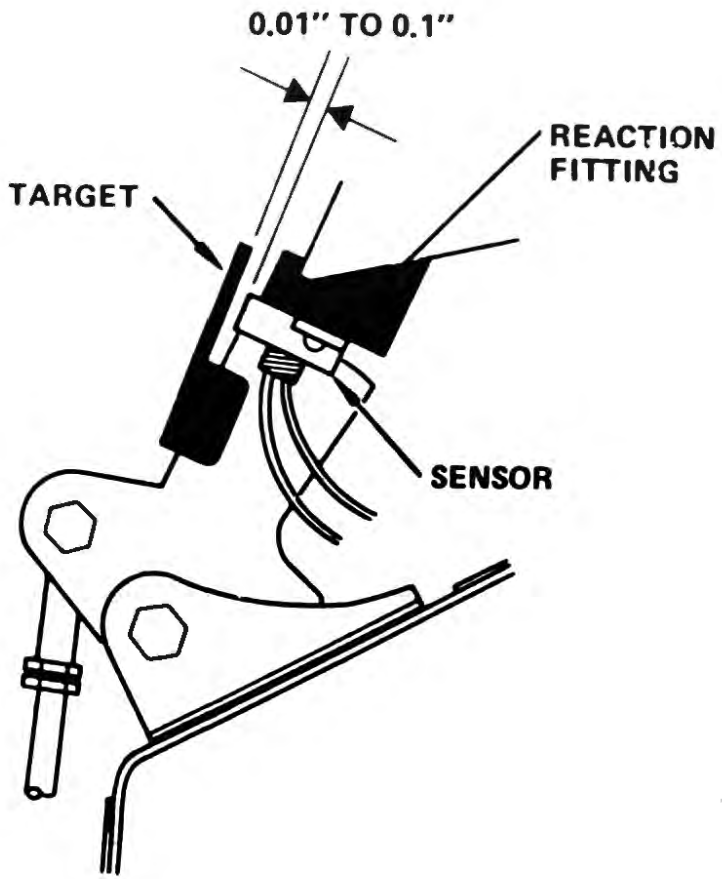
Aircraft incorporating Service Bulletin 52-118, and Lockheed ship serial numbers 1157 and up, should have a safety stop clearance of 0.1" to 0.15".

Clearance on other aircraft should be 0.03" to 0.09". If the clearance is greater than 0.09", but less than 0.15", DO NOT adjust the safety stop. The intent of the SB is being complied with. Obtain an Engineering Discrepancy, or record partial accomplishment of SB52-118.

PROXIMITY SENSOR



C-2 DOOR



C-1, C-3 DOORS

A proximity switch is used at each of the cargo doors, to control the respective cargo door warning light on the FE/SO panel. Light operation is a function of safety stop position.

The sensor is located in the cargo compartment ceiling structure, and the target is attached to the safety stop. The stop must be fully extended to extinguish the light.

The door locked green light, on the face of the door, does not relate to the safety stop. It is controlled on or off by the lock actuator lock limit switch, and must come on after the FE/SO panel light has extinguished.

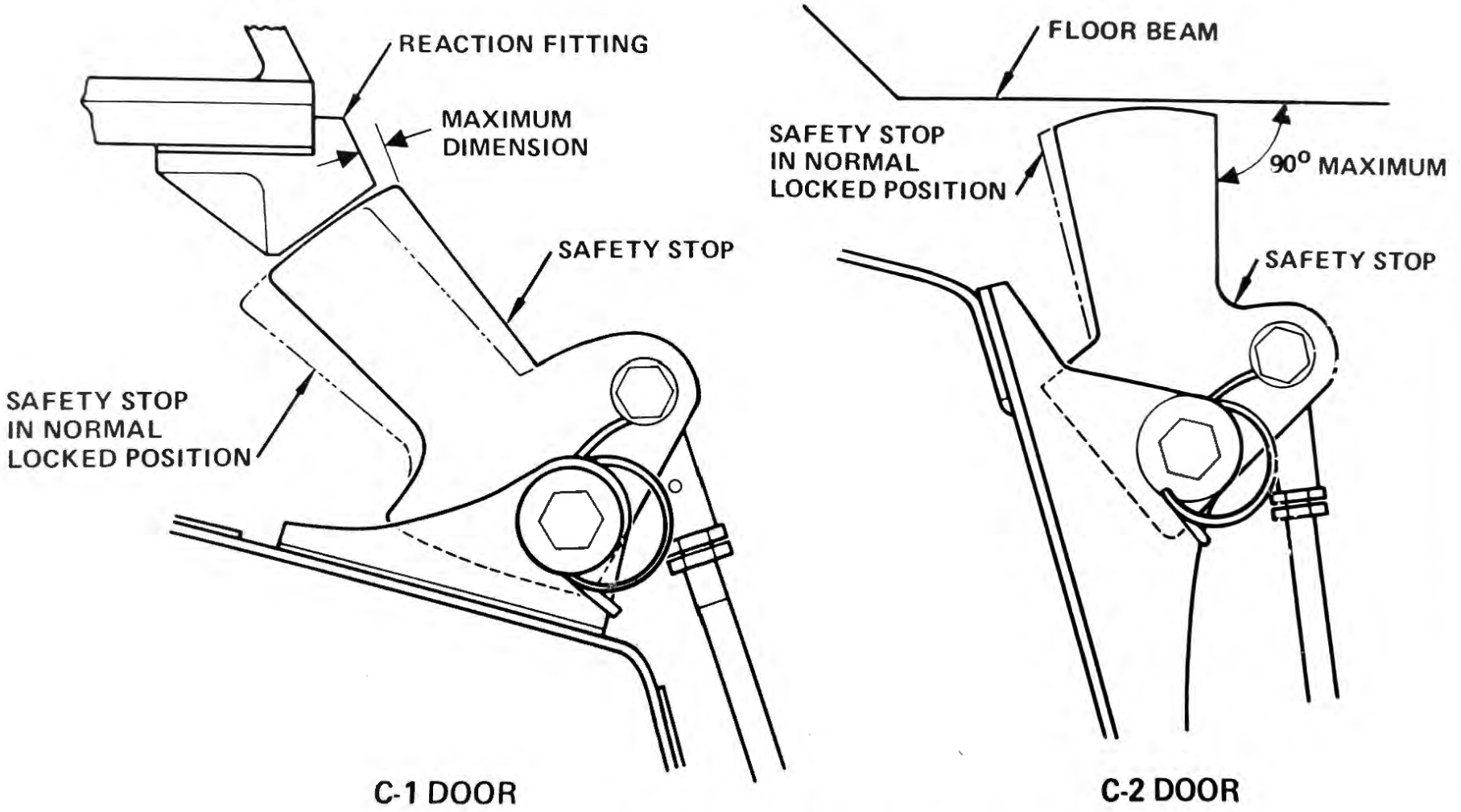
The proximity switch gap has to accommodate 4 different door positions, each causing a variation of gap dimension, while maintaining proper switch operation:

- door locked electrically
- door locked manually
- door placed in the wedged condition
- aircraft pressurized and all pressure stop and hook surfaces in contact.

Proximity sensors are adjustable on slotted bolt holes.

An accumulation of extreme tolerances on door hook clearance, pressure stop clearance and proximity switch gap could cause sensor/target contact when the aircraft is pressurized – a situation that will be worsened with manual operation. This can cause the proximity system to saturate and give a failsafe – door unlock – indication. In this event, the intent of Service Bulleton 52-121 may be embodied by attaching self adhesive mylar tape, 0.005" thick, to the face of the target.

PROXIMITY SENSOR



TYPICAL LIGHT ON DIMENSION MEASUREMENT

PROXIMITY SENSOR CHECK

Electrically close the door.

Check proximity sensor/target gap is 0.08" to 0.15".

Ensure that door open indication at the FE/SO panel is extinguished.

ADJUSTMENT

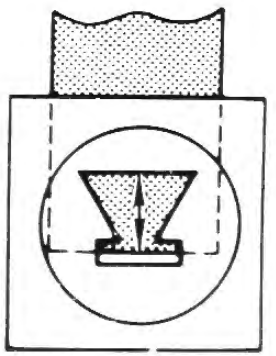
Adjustment of the proximity sensor is dependent on the safety stop mechanism being correctly rigged.

- Manually drive the lock actuator to its lock position.
- Insert the rig pin in the lever locking latch.
- Check that the lock position of the safety stop is within tolerance.
- Insert wedges at the four corner pressure stops to hold the door outward.
- At C-1 and C-3 doors, loosen the sensor attachment bolts, and adjust the proximity sensor/target gap to 0.01" to 0.1".
- At the C-2 door loosen the proximity sensor support bracket attachment bolts and adjust the proximity sensor/target gap to 0.01" to 0.1".
- Remove the wedges and the rig pin and operate the lock actuator manually to retract the safety stop, until the door open light at the FE/SO panel comes on.
- Check dimension between the inboard edge of the reaction fitting and the inboard face of the safety stop in accordance with the table.

If the dimensions are exceeded, reduce proximity sensor/target clearance and recheck. Any persistent problem indicates a malfunction of the proximity system.

Service Bulletin 53-069 is incorporated in Lockheed ship serial number 1125 and up. It provides a proximity sensor support bracket integral with the reaction fitting at C-1 and C-3 doors.

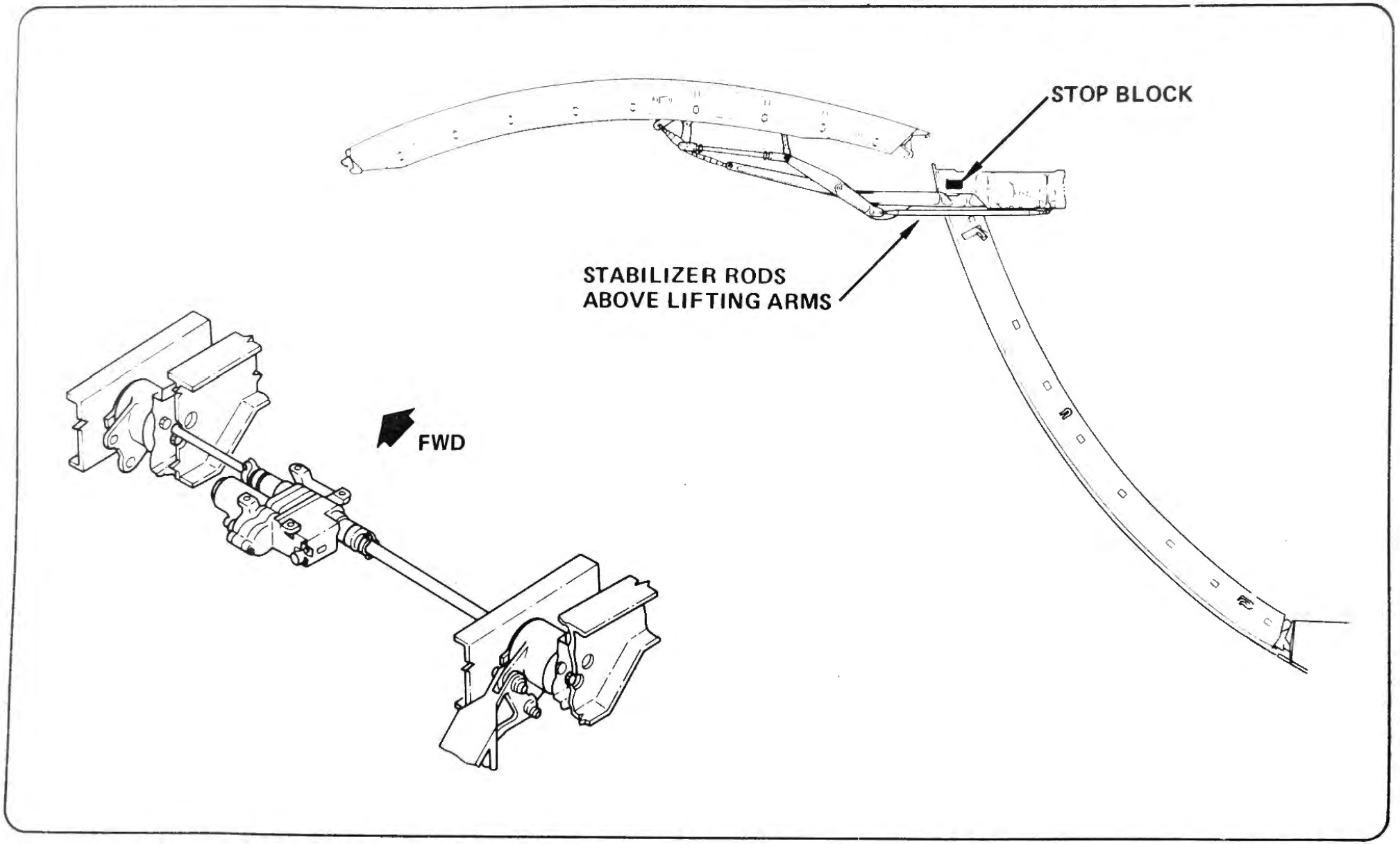
STUDENT NOTES:

DOOR	SAFETY STOP		
	THIN FINGER	FAT FINGER	DIRECT VIEW
C-1	0.26" MAX ON AIRCRAFT WITH SEPARATE PROXIMITY SENSOR SUPPORT BRACKET 0.15" MAX ON AIRCRAFT WITH INTEGRAL REACTION FITTING AND PROXIMITY SENSOR SUPPORT BRACKET	0.25" MAX	WHITE INDICATOR STILL VISIBLE IN TRIANGULAR CUTOUT OF APERTURE BRACKET 
C-2	90^{o} MAX ANGLE BETWEEN INBOARD FACE OF SAFETY STOP AND FLOOR BEAM		
C-3	0.35" MAX		

DOOR OPEN LIGHT ON

PROXIMITY SENSOR

42 DOOR FULL OPEN POSITION



The door full open position is controlled by a limit switch located in the gearbox section of the lift actuator. The door is considered to be fully open when the stabilizer rods are above the bottom edge of the lifting arms. Stop blocks are located in the door surround above the forward lifting arms at the C-1 and C-2 doors. The stop blocks, or the surround structure at the C-3 door, should not be contacted at the full open position. This ensures complete electrical control, and prevents damage to the pressure seal.

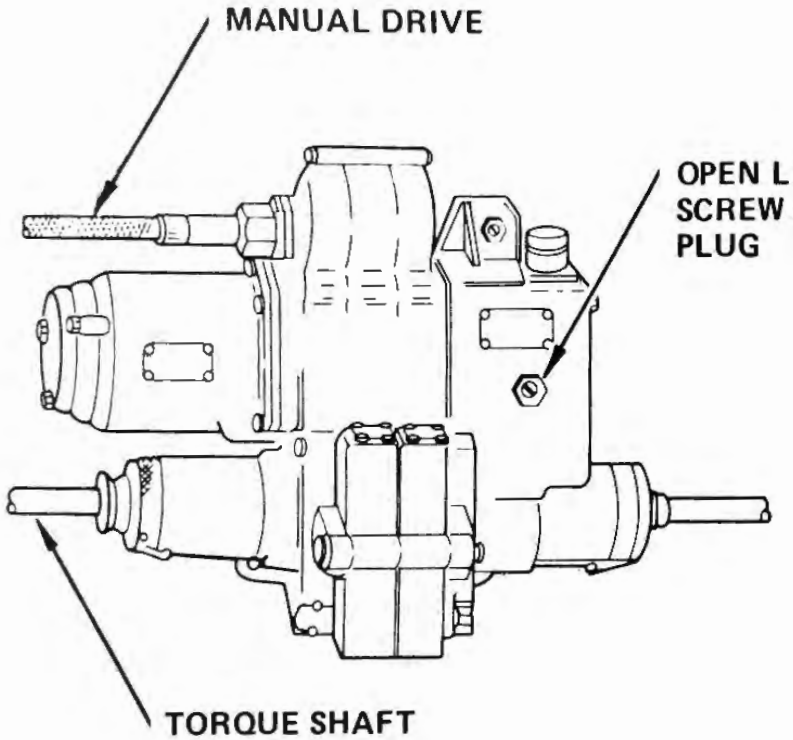
The open limit switch is operated by a cam within the actuator rotated as a function of output shaft operation.

The cam is indexed at the actuator closed position by inserting a rig pin, through a slot in the actuator end case, into a hole in the cam. Fine adjustment of the open limit switch is provided by a screw, inside the actuator, accessible by removal of a screwed plug in the lower face of the actuator.

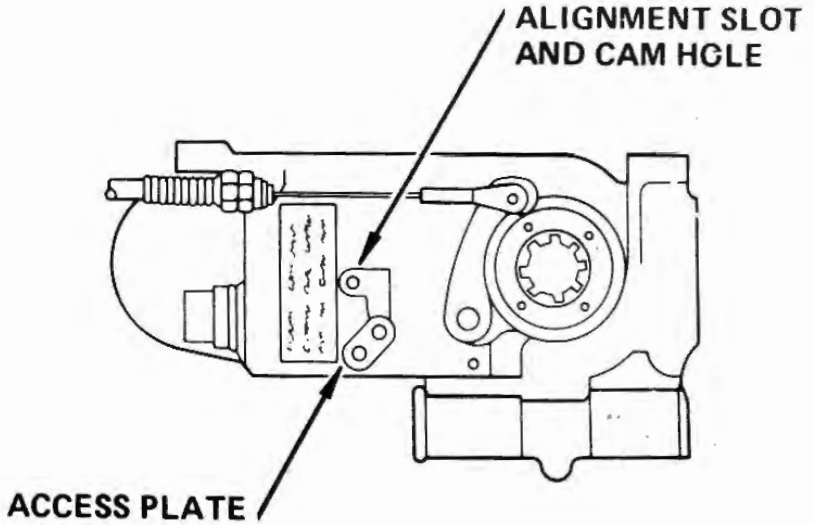
To ensure that the open limit switch is in the fine adjustment range, it is essential that the actuator is at its closed position when the door is closed.

43 DOOR FULL OPEN POSITION

44 DOOR FULL OPEN POSITION



OPEN LIMIT SWITCH ADJUSTMENT



DOOR CLOSED INDEXING

DOOR OPEN POSITION CHECK

Select the door open, until the actuator motor stops.

Check that the stabilizer rods are above the lower edge of the lifting arms.

Check that there is no contact between the lifting arms and the stop pads or surround structure.

ADJUSTMENT

If the door does not stop within the correct open parameters, it will be necessary to adjust either the indexed position of the actuator, or the fine adjustment screw of the open limit switch.

- Close the cargo door.
- Loosen the access plate retaining screw at the aft face of the actuator.
- Insert a rig pin through the slot into the cam hole, or view for correct alignment.

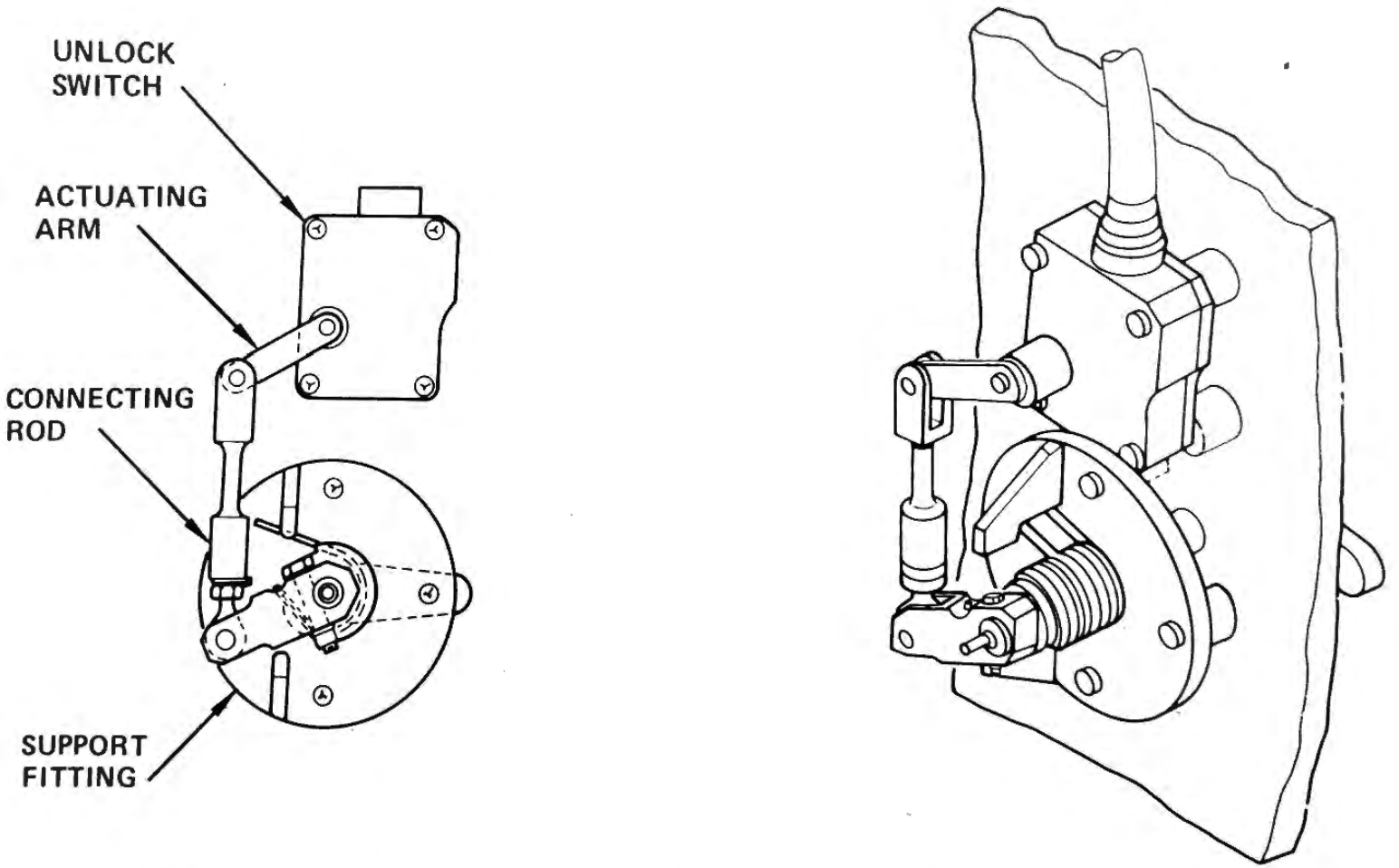
If the hole is not aligned with the slot, remove the torque shaft collars, pull the shafts into the actuator to disengage the splines from the lift gearboxes, and manually rotate the actuator until the pin can be inserted in a horizontal position.

Reconnect the torque shafts, remove the rig pin, and close the access plate.

- With the actuator correctly indexed, remove the plug at the lower face of the actuator and adjust the slotted screw, as necessary, to achieve the correct door open position.

> Clockwise adjustment lowers the door, counterclockwise adjustment raises the door.
>
> One full turn of the screw adjusts the door through approximately 4 degrees.

DOOR UNLOCK SWITCH



TYPICAL DOOR UNLOCK SWITCH AND HANDLE INSTALLATION

During the door opening mode, only, the lock actuator is operated by the door unlock switch. The switch is operated by a handle which is located on the outer face of the door – or in the case of the C-2 door – on the forward end of the underwing fairing attached to the door. Movement of the handle from the horizontal position, against spring loading, will rotate its shaft and a lever inside the door. An adjustable rod connects from the lever to the switch actuating arm. Range of movement is limited by two fixed stop faces on the handle support fitting.

The switch is robust, and operating tolerances are very broad.

SWITCH OPERATIONAL CHECK

Slowly rotate the handle until the lock actuator begins to operate.

Check that handle movement for actuator operation is 15^{o} to 35^{o}. This angular measurement may be equated to approximately 0.5'' to 1'' movement of the handle.

ADJUSTMENT

If switch operation occurs outside the prescribed tolerance, disconnect the adjustable rod from the lever and adjust the rod end as necessary.

DOOR UNLOCK SWITCH

STUDENT NOTES:

Various modifications are proposed for future production incorporation, or for installation as a Service Bulletin on existing aircraft in the fleet. These are all specifically intended to improve operational reliability of the cargo door systems, and thus reduce maintenance costs, and dispatch delays.

LOCK ACTUATOR HEATER

For cold weather operators. A heater blanket is taped around the whole actuator to maintain a constant temperature to reduce thermal shock and prevent freezing. The heater will be on, any time that power is available on the aircraft.

SAFETY STOP PUSH PULL ROD

To eliminate push/pull cable problems. The safety stop is connected by an adjustable rod, through an idler lever and a link, to the lever locking latch.

MANUAL LOCK HANDLE

To convert the lock function from electrical to manual control. The lock actuator is removed, and its function replaced by a manual handle. Used with the rod installation only.

DOOR CLOSED LIMIT SWITCH

To ruggedize the door closed limit switch. The micro switch is replaced by a rotary type switch identical to the door unlock switch, and similar in operation.

DOOR SEAL

To reduce vulnerability during cargo loading, and eliminate the water and debris trap at the door sill. The lower 25% section of the door seal is installed on the door, while the remainder of the seal remains on the door surround structure. The door sill is given a downward, outward slope by closing and sealing the area with a stainless steel fillet. As the door moves down to the latched and locked position, the seal makes a face-to-face contact with the fillet.

STUDENT NOTES: